

Mitsuo CHIHARA*: *Compsopogonopsis japonica*, a new
species of fresh water red algae

千原光雄*: 淡水産紅藻の一新種オオイシソウモドキ

In the course of our study on the fresh water algae in the central part of the main island of Japan, we have often encountered a filamentous red alga, which was undoubtedly a member of the Compsopogonaceae, Rhodophyta. After a careful examination of the specimens and a laboratory culture experiment with the germinating monospore, it became clear that it was an undescribed alga with a structure fundamentally identical to that of the genus *Compsopogonopsis* Krishnamurthy (1962).

The following is a description of the new alga, which is to be named *Compsopogonopsis japonica* sp. nov. (Fig. 1—the holotype specimen).

Thallus filamentosus, cylindricus, 30–40 cm altus, 0.5–1.0 mm diametro, atrocyaneus vel olivaceus, singulariter e disco basali multicellulari exoriens, uniseriatus primo, multiseriatus postea, cellula centralis et cortex constans e cellulis bistratis, profuse ramosus; cellula apicalis tholiformis, 11–18 μ m alta, 13–18 μ m lata; cellulae strati extimi in parte adulta tetra-, penta-, vel hexangulares aspectu superficiali, 30–50 μ m longae, 25–40 μ m latae; reproductio asexualis per monosporam; monospora in cellula corticali vel in cellula partis uniseriatae innata per divisionem obliquam vel longitudinalem, spherica, 17–23 μ m diametro; reproductio sexualis ignota.

Holotypus ad locum Sakai, Gunma-ken dictum, m. Aug. d. 20, 1969 lectus, in herb. TNS depositus (AL 24051).

The first discovery of *Compsopogonopsis japonica* was near Sakai city in a small pond artificially made along the River Tone. Later the alga was found again in a small stream near Gyoda city, Saitama Prefecture. The specimens found near Sakai city were growing abundantly as attached to stones and pebbles in the water of 1 to 1.5 meters in depth. The specimens found near Gyoda city were growing in water about 30 cm in depth epiphy-

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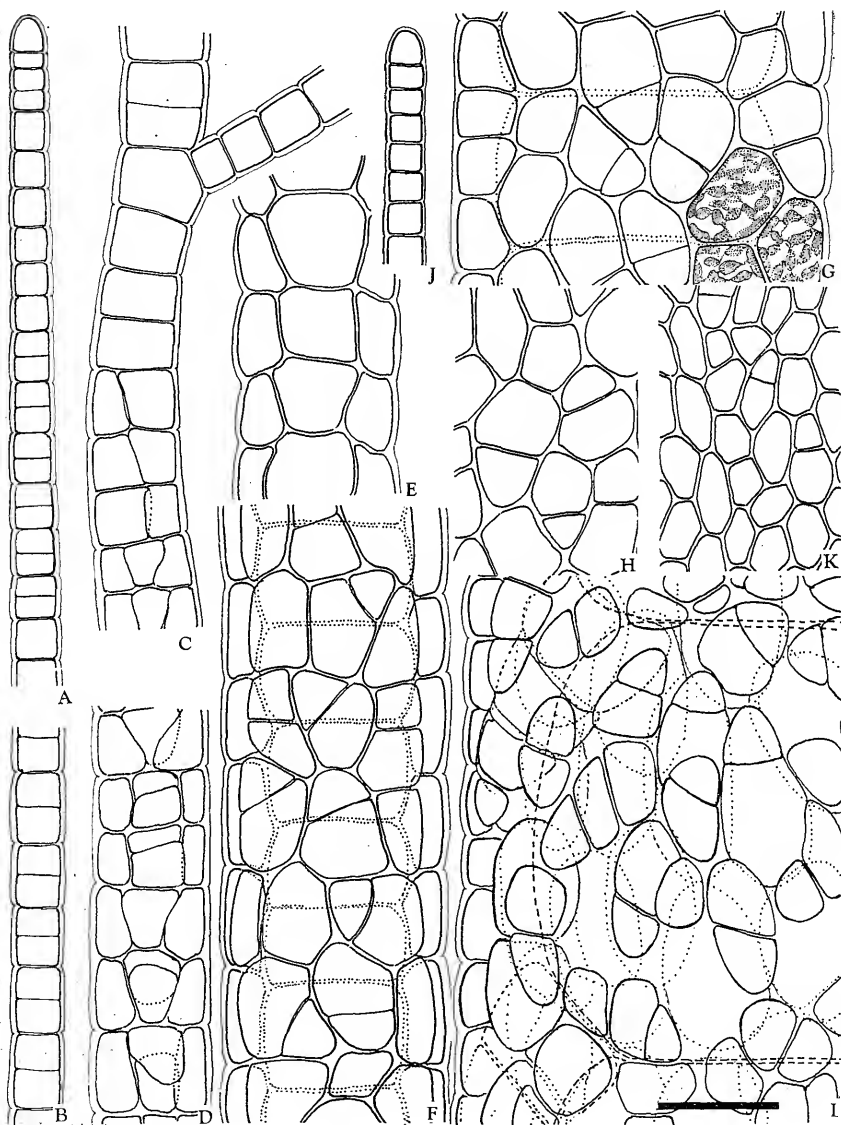


Fig. 1. *Compsopogonopsis japonica* Chihara sp. nov. (holotype, TNS-AL 24051). $\times 1/2$.

tically on a *Pithophora* plant that was attached to the concrete wall of a waterway. At site near Sakai city, wherever *C. japonica* was found to be abundant, there were a population of *Potamogeton berchtoldii* Fieber and also beds of *Hydrilla verticillata* (Linn. f.) Casp. and *Myriophyllum verticillatum* Linn. In general appearance as well as in habitat, *C. japonica* is very much alike *Compsopogon oishii* Okamura, which is not a rare alga in this area.

It is apparent from periodical field observation that the alga is seasonal in its growth. Young thalli are found in spring and early summer. They become abundant in summer and then mature, forming monospores during fall. By early winter, the thalli visible to the naked eye usually disappear. Monospores are formed in the monosporangia which are produced by an unequal diagonal division of the cells and usually the smaller daughter cell develops into monosporangia. Any of the cells of the filament is capable of transforming into a sporangium. Upon germination, the monospores liberated develop into a small disc-shaped holdfast consisting of several cells, and then a single upright filament arises from the portion of the original spore cell. The upright filament is first elongated club-shaped and soon a dome-shaped cell which becomes the apical cell of the filament is cut off at the apex. The apical cell gives rise, by successive transverse divisions, to a uniseriate, erect filament consisting of flat discoid cells (Fig. 2, A, B). The filament increases in length by apical as well as by intercalary growth, and later the formation of the cortex takes place in the following manner: at a certain distance from the apex, the axial cell cuts off peripheral segments by periclinal divisions, and later these peripheral segments produce two or more tubular outgrowths mostly at the lower end which develop downward closely appressed to the axis (Fig. 2, C-F). The tubular outgrowths then undergo anticlinal cell divisions once to a few times, resulting in the formation of a cortical sheath consisting of pseudoparenchymatous tissue that surrounds the axial cells (Fig. 2, F-I). During the progress of growth, the axial cell increases in size without dividing. The cortex thus formed in the present alga is fundamentally dissimilar to that of any species of *Compsopogon*, but identical with that of *Compsopogonopsis leptoclados* (Montagne) Krishnamurthy.

The family Compsopogonaceae currently consists of two genera, *Compsopogon* and *Compsopogonopsis*. *Compsopogon* was established by Montagne



(1846) with *C. coeruleus* as the type species, and it accommodates at present eleven species. In contrast, *Compsopogonopsis* has received only one species since it was established by Krishnamurthy (1962), with *C. leptoclados* as the type species, separating from *Compsopogon* by the presence of a characteristic feature in the formation of cortex. *C. leptoclados* was first described under the name of *Compsopogon leptoclados* by Montagne (1850), on the basis of the specimens from French Guiana. It was later found also in Guadeloupe¹⁾. Fortunately, I have had an opportunity to examine, with the help of Professor Kozo Iwamoto of Tokyo University of Fisheries, one authentic specimen of *C. leptoclados* collected "in fresh and saline water in the creek, in the vicinity of Cayenne, June 26, 1921, by W.E. Broadway²⁾" and now deposited in the Herbarium, Tokyo University of Fisheries. This specimen apparently has a peculiar features in the development of the cortex, a character by which *Compsopogonopsis* is separated from *Compsopogon*. It is much similar to the present alga in gross morphology as well as in internal structure. However, it differs from the present one in the size of cells in the outermost layer of thallus; those of the Guiana specimen collected by Broadway are much smaller, measuring 25-38 μm long and 15-25 μm wide (Fig. 2, K), whereas those of the present alga are 30-50 μm long and 25-40 μm wide (Fig. 2, G, H). According to the account given by Krishnamurthy (1961), who examined several authentic specimens, including the holotype, of *C. leptoclados* deposited in Muséum National d'Histoire Naturelle, Paris,

- 1) Weiss and Murray (1909) and Jones (1955) reported the occurrence of *Compsopogon leptoclados* in the Reddish Canal, Manchester, England, but it was *C. coeruleus*, according to Krishnamurthy (1962) who examined both of their specimens preserved and living material of the alga from the locality cited.
- 2) Distributed by the Gray Herbarium of Harvard University under the title of "Plants of French Guiana, No. 581".

Fig. 2. A-I. *Compsopogonopsis japonica* Chihara. A. Terminal part of thallus showing uniseriate arrangement of cells. B. Upper part of thallus showing intercalary cell divisions. C, D, F-I. Parts of thallus showing various stages in the formation of cortical layers (surface views). E. Part of longitudinal section through axial cell showing the formation of cortex. J, K. *Compsopogonopsis leptoclados* (Montagne) Krishnamurthy (distributed as *Compsopogon leptoclados* Montagne by the Gray Herbarium, Harvard University: Plants of French Guiana, No. 581). J. Terminal part of thallus. K. Surface view of thallus showing size and arrangement of the outermost cortical cells (cf. Fig. 2. H). A bar indicates 50 μm in length.

the apical cell was pointed. However, it is not true in the Broadway's specimen and the apical cell is dome-shaped (Fig. 2, J). On account of it, it would be better not to use this character at present as one of the criteria for distinguishing *C. leptoclados* from our alga.

Compsopogonopsis has long been thought of the monotypic genus and known only from the tropical and subtropical regions in the Southern hemisphere. In this connection, it should be worthy of note to find the second species of this genus in the temperate region in Japan.

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群馬県境町付近と埼玉県行田付近で採集した淡水産紅藻 オオイシソウに類似した植物を調べたところ、皮層部は、中軸細胞より仮根状に伸長した細胞群により形成されることが判明した。この皮層部の形成様式は、それをもつが故にオオイシソウ属 *Compsopogon* より分離、設立された属 *Compsopogonopsis* の特性と一致する。日本産の植物は、この属のただ 1 種の既知種である基本種 *C. leptoclados* (Montagne) Krishnamurthy とは皮層細胞の大きさで異なることから、*C. japonica* Chihara sp. nov. (新和名オオイシソウモドキ) の種名が与えられた。